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In this issue, we take a closer look at some areas, that though important, can be overlooked. So let's take . . .

a second look at maintenance and refueling

Take a second look at safety and maintenance

Those of us who work in the maintenance arena know all too well the crisis management we have come to accept as the norm. But during the daily routine of putting out all the little fires, do we really stop and think about the decisions we make, about soldiers we may be putting at risk, and equipment we may risk damaging?

Yes, I too can look back and remember times when in the haste to "just get it done", things may not have always been completed in the safest manner. Anyone who has worked maintenance knows that at times we have to improvise, suck it up, just do it. When you as a leader hear these words or phrases, STOP. Look at the implied tasks. You were not told to put soldiers or equipment at risk—quite the contrary. As leaders we are charged with the well-being of our soldiers and equipment.

JUST GETTING IT DONE

With more and more of our maintenance time being eaten up by other activities, it is more important now than ever that we keep track of what is going on around us. How many times has one person started a job only to be pulled off the job before it is completed? Someone else has to finish it, if it gets finished. What sort of hand-over is happening?

In Korea, Delta Companies routinely work a day shift and a night shift. When one shift ends and the other one starts, is there a good hand over? When questions come up, do we just put them to the side, or do we ask the right people the right questions? Do we always match the right person to the job? If we don't have time to do it right the first time, then we surely don't have time to do it twice.

Nobody wants to look stupid in front of others, but the questions not asked can result in major consequences. Encourage people to ask when they're not sure. Let them know that if it doesn't look right, it probably isn't. The next soldier who gets hurt, or the next piece of equipment that gets destroyed is just around the corner unless someone speaks up. We look to Delta Company to perform some of the heavier maintenance that comes due on a unit's aircraft. But are we as maintainers and leaders doing our part? Take for instance new mechanics coming into a unit straight from AIT. Where do we assign them? The argument is made, that the line companies don't have the time or personnel to properly supervise new people. So where do we assign them so they can gather skills and the have the actual wrench-turning experience needed on a daily basis in a maintenance unit? That's right, we assign them to Delta Company, where the only experience they can gather is from all the other brand-new mechanics.

The United States Army Military Occupational Specialty schools do a fine job of turning a young person into a basic aircraft mechanic, not a crew chief. It is up to us to mold these soldiers into maintainers. Let's not put all the responsibility of the continued training of these new mechanics on the unit's support company. Remember, Delta Company is working on your aircraft. Line platoons, step up to the plate. Help train your replacements. The sharp maintainers of today may not be here tomorrow.

FORGOTTEN EQUIPMENT

Let's look at other ways to reduce risk in the maintenance areas. What is the most under-maintained equipment in the Army? In my opinion, that would have to be ground-support equipment (GSE). Who maintains this equipment?

The answer often is, nobody who has ever been trained on the maintenance of GSE. Improperly maintained GSE presents a risk and potential for an accident. So how can we limit that risk? We can keep those maintenance stands inspected, properly maintained, painted and marked. We can make sure that we use the rails when using work platforms or maintenance stands—they were put there for a reason. Look at those tugs; designate people to ensure that the tugs are inspected first thing in the morning. You wouldn't drive your car for months on end without at least checking the oil. And what about those AGPUs (aviation ground power units)? Do the soldiers operating them really know what they're doing? When was the last time that AGPU was looked at? I know, you're thinking that if you don't have enough time or people to do what you have to do now, how can you afford to cut a person

loose to look at the tug or an AGPU? Well, look at it this way. Your soldiers use that GSE. They climb on it, they drive it, and they operate it. Get one of them hurt and life just got tougher. We have a thing called Sergeant's time. Why don't we use it to do refresher classes on the operation of some of our equipment? Talk about things like servicing the hydraulic reservoir on the AGPU, the differences in the hydraulic fluids, and why we use the types we do. Teach soldiers some of the safeguards we have to keep impurities out of our aircraft hydraulic systems.

TOMORROW'S STANDARD

Those of us in the maintenance world sometimes have our own way of doing things. We as a community need to open our eyes to safer ways of accomplishing the mission.

When I look back over the years, I wonder if it was fate, or did we just master the wrong way of doing things, the "just get it done" way? So, think before you send Joe to Delta Company to work on your aircraft, or to drive that tug or operate equipment that hasn't been looked at for quite some time. The "just get it done" way that you show to your soldiers today will be the standard for the way the Army does business tomorrow.

—CW4 Todd Toth, USASC, DSN 558-2781, (334) 255-2781 totht@safetycenter.army.mil

Take a second look at FOD!

Numerous articles have been written concerning foreign object damage (FOD) and command emphasis has always been to reduce the number of FOD incidents through FOD walks, thorough pre-flights, and education. However, do we really place an emphasis on ensuring our aircraft are safe from FOD?

The purpose of this article is not to point fingers or to place blame, but rather to heighten awareness to a problem that pilots, maintenance personnel, and other flight line operators overlook.

Recently here at Fort Rucker, the "Home of Army Aviation", we exposed ourselves to an unnecessary FOD risk. The airfield street sweeper was in maintenance for a long duration, resulting in the ramps being unswept and allowing debris such as rocks, small branches, and safety wire to accumulate.

How did this breakdown occur? There must have been hundreds of aircrews who walked along the ramp and overlooked the easily ingestible debris lying on it. Let's face it—FOD is boring! We are all busy with preparing for training, a mission, or talking about the day's flight. How as aviation leaders can we prevent the needless damage in an era of budget cuts?

Training, education, and monthly FOD walks are ways that have prevented FOD incidents in our unit. It was during our monthly FOD walk that we discovered how bad the ramp had become. Training and education is key to FOD prevention. It only takes one fouled engine to get the command's attention. Posting of FOD incidents and an SOP that covers the unit's FOD policies are good starting points. Another good way to educate aircrews is to place FOD in the crew brief. A simple statement indicating that the crew will look around the aircraft for debris prior to beginning the preflight might mean the difference between a FOD incident or a safe engine start. Another way towards prevention is to use your FOD Officer/NCO effectively. This individual walks the flight line and schedules the unit's monthly FOD walk. The unit's monthly FOD walk does three things: first it removes debris from the flight line, second it places FOD on everyone's mind at least once a month, and last it shows the command's commitment to preventing FOD. The FOD Officer should work hand-in-hand with the Safety Officer. Two people actively looking for problems on the flight line will do better than one.

How often do we concentrate on "Safety" without thinking about FOD? Most of the time, we think of safety as memorizing emergency procedures, planning our missions thoroughly, conducting recons, and operating our aircraft in a responsible manner. Failure to think of these could result in loss of life. Failure to see that piece of debris below an engine intake could also result in loss of equipment or worse, loss of life. It is too expensive to overlook FOD. Together working proactively as a team, we can reduce most airfield FOD, thereby reducing accidents and incidents.

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FOD—You are what you eat

This incident happened quite a while ago. This article has been sitting in my in-basket longer than I care to admit because I couldn't decide how to word the lessons learned, the part that ties everything together. Here's what happened.

We were conducting training for the external transport of cargo, using the helicopter's single point cargo hook. We performed operational power checks on all three engines en route to our operating area. The power checks would tell us how much torque each engine could produce. It was a cool winter day, and the MH-53E aircraft was relatively light, so this procedure was almost a mere formality. All three engines produced ample power, though the No. 2 engine was considerably weaker than the other two. I noted that piece of information, probably insignificant, to the crew, filed it away in the lesser-accessed regions of my mind as well as on my kneeboard, and continued onward.

Operations proceeded uneventfully enough at the LZ. The student pilot (SP) hovered over the load for his third lift. The load was a metal I-beam, weighing in at around 8,000 pounds. The student was an enthusiastic naval aviator, weighing in at around 170 pounds. It was his job to overcome the devious metal I-beam.

On the first lift, the I-beam, though still on the deck, kept moving below the helicopter, jinking to the left and right, forward and back. Understandably, the SP was forced to constantly shift his hover, in a near-futile effort to stay immediately above the load.

By the third lift, the metal I-beam must have gotten tired of fighting, and our hover was considerably more stable. Very stable, in fact. The student was doing a good job of controlling the aircraft.

A LOUD BANG

There we were, hovering at about ten feet. The four-man ground crew had just attached the straps on the I-beam to the helo's single point external cargo pendant. We started to climb straight up to put tension on the load. The ground crew was to stay beneath the aircraft at this time, ensuring the rigging didn't get tangled. We would thus ensure that they cleared out from the area before we actually lifted the load off the deck. I, for one, wouldn't want to stand next to 8,000 pounds of building material as it begins to swing through the air.

As we increased power and started to climb into a higher hover, a loud bang came from the cabin. It had to have been loud, because we heard it. Softer sounds, like those heard at a rock concert, are barely audible over the helicopter's freight train roar. The SP froze the controls as I profoundly and sincerely uttered over the ICS, "What was that?"

My first thought was that something was wrong with the rigging—perhaps a strap frayed and snapped. But I was looking at the load in my mirror, and everything looked fine. (MH-53Es have adjustable mirrors on appendages off the nose of the aircraft, like catfish whiskers. Designed for monitoring minesweeping equipment, they're also useful for external operations.) My second thought was that a window or door had slammed shut, something a crewman would soon inform us of.

After a few seconds of silence, my concern grew. And I took the controls. Although the SP was flying well, this was his first time to conduct such an operation in this aircraft, and there wasn't much room for error. Remember that we still had the load attached, and there were still four people underneath us. Inadvertently lifting the I-beam or letting the aircraft settle to the ground would be on the "bad" end of the good/bad continuum.

No sooner had I taken the controls than the aerial observer, who was an experienced crew chief, notice the No. 2 fuel gage reading zero. He immediately, not to mention profoundly and sincerely, uttered over the ICS, "Number two engine."

Hearing this, I immediately looked at the torque gauge and saw that the No.2 engine wasn't producing any power. Loud bang plus no torque equals compressor stall. To confirm the compressor stall theory, I glanced at the T5 gauge and noticed the needle rising like a second hand going through nine o'clock, an overtemp condition and typical symptom of a compressor stall. Fortunately, the remaining two engines easily produced enough power without allowing any settling or perceptible drop in rotor speed.

I immediately (I use this word frequently because this all occurred in about ten seconds) pickled the load. Once again, the mirror proved valuable, as I was able to ascertain that the load was completely released without having to get confirmation from a crewman. I then announced that we had a No. 2 compressor stall,

and we were going to land. As prebriefed with the ground crew for an emergency in a hover, we slid forward and to the left before landing.

Ordinarily, I would wait a few extra seconds until landing before executing any other emergency procedures, but a compressor stall, especially with the No. 2 engine, presents a high probability of an ensuing engine compartment fire. Consequently, I instructed the co-pilot to secure the No. 2 engine. The SP reacted quickly and properly by placing his hand on the No. 2 engine speed control lever, getting dual confirmation from me that this was the correct engine, and securing the engine. The crew cleared us below, and we softly landed in the grass.

WHERE'S THE FIRE?

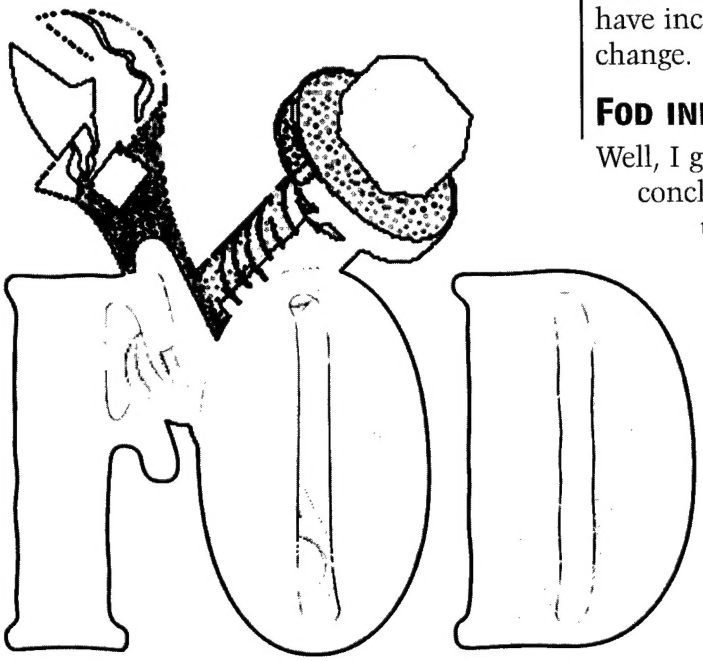
Still concerned about a possible fire, I eloquently asked over the ICS, "Anybody see any smoke or anything around the engine?"

A crewman responded, with equal eloquence, "I think we got some smoke around the number two."

The SP got ready to blow the fire bottle, placing his hand on the No. 2 engine fire T-handle. Pulling the T-handle, located on the cockpit overhead, and pressing another switch, would discharge a fire-extinguishing agent into the engine compartment. I then asked the crew about the status of the fire, to which the crew chief responded something along the lines of, "Don't think we got a fire back here. Don't see any more smoke."

With that bit of good news, we did not use the fire bottle, but did expeditiously secure the engines and rotor. Post flight inspection revealed that there had been a flash fire in the engine compartment, and it would have gotten quite a bit worse if the engine had been left running much longer.

Further postflight, this time by maintenance personnel, revealed the probable cause of the compressor stall. At the intake of each engine, the H-53E has something called an engine air particle separator (EAPS). It's a complicatedly simple device designed to prevent the engine from ingesting such FOD as bolts, rivets, and washers.



Ironically, it was probably a bolt from the EAPS that became FOD, and caused the compressor stall. We had preflighted the engine intake and EAPS barrel, but it was a cursory preflight. Upon postflight, maintenance found a missing rivet at the front end of the EAPS. Needless to say, we hadn't previously noticed it missing or loose.

As a result of this potential mishap, squadron pilots and aircrews are paying closer attention to the EAPS barrels during preflight. The squadron has designated personnel to specifically examine the EAPS as a part of daily inspections. Furthermore, a minor design modification of EAPS was already in the works at the time of this incident. All squadron aircraft have incorporated this airframe change.

FOD INDIGESTION

Well, I guess it's time for the conclusions. We already know that if an engine eats FOD, it'll become nothing more than a useless collection of nuts, bolts, gears, and nicked compressor blades. Needless to say, poor preflight inspections are inexcusable, but preflights can reveal only so much. I should have noted the power the engines had produced on previous flights, and returned to base when I noted the weak No.2 as a new abnormality. In retrospect, I think that the control transfer added an unnecessary complication. It would have been easier to diagnose the problem and execute the appropriate emergency procedures while not having to maintain a stable hover. We were fortunate to have not learned more serious lessons at a much higher price.

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This little FARP should have been a piece of cake...

(A lesson in how quickly a simple refueling can turn ugly.)

Our unit was executing its first forward area refueling point (FARP) operation since recovering from deployment in support of Operation Allied Force and Joint Guardian. Unit morale was high; we had completed this very tough deployment and brought all soldiers and equipment home unscathed.

Morale in the 3/5 platoon was particularly high—during the deployment we had pumped over 900,000 gallons of fuel and self-deployed over treacherous mountain roads from Albania to Macedonia without incident. This little daytime FARP in the unit's own back yard would be a piece of cake, just a chance to train some newbees. By the end of the day, however, even the most salty officers and sergeants would have a lesson in just how quickly a simple little FARP could turn ugly.

The FARP was set up to support a flight of five UH-60 Black Hawks executing a day tactical mission in the local helicopter training area. The plan, as briefed, was that all five aircraft would cycle through a four-point FARP set up in a fly-through configuration. If everything went right, four aircraft would refuel simultaneously and be out of the FARP in less than five minutes.

Initially everything went by the plan. The FARP was set up, fuel was tested and the site was safety'd well before the expected arrival time of the inbound aircraft. The aircraft arrived at the FARP on time with refuelers standing by the four points ready to execute. The first four aircraft landed directly to their points, in chalk order, and refuel nozzles plugged into the aircraft.

Three minutes into the refuel, it all still seemed to be going like clockwork.

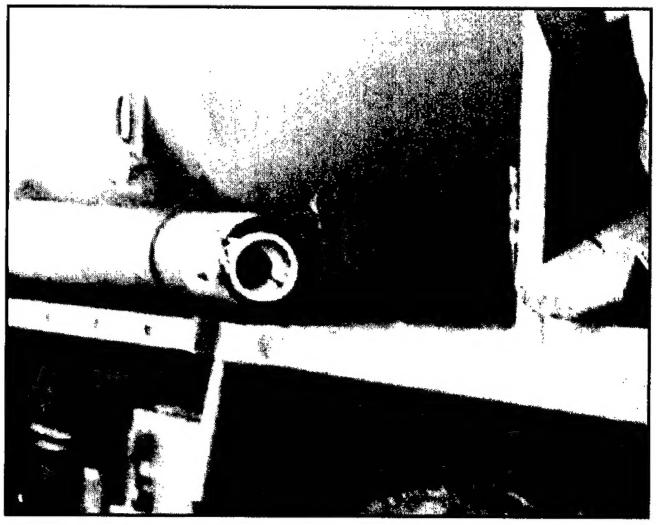
The trouble begins

The first sign of trouble was at point one. When the chalk one aircraft D-1 refuel nozzle was disconnected, it immediately started spraying the aircraft and refueler with gallons of fuel. Moments later the same thing happened to the aircraft in point two and before you could say "Shut the fuel off" points three and four had also suffered the same fate. In the course of less than 30 seconds the simple little FARP had four running aircraft and refuelers drenched in fuel!

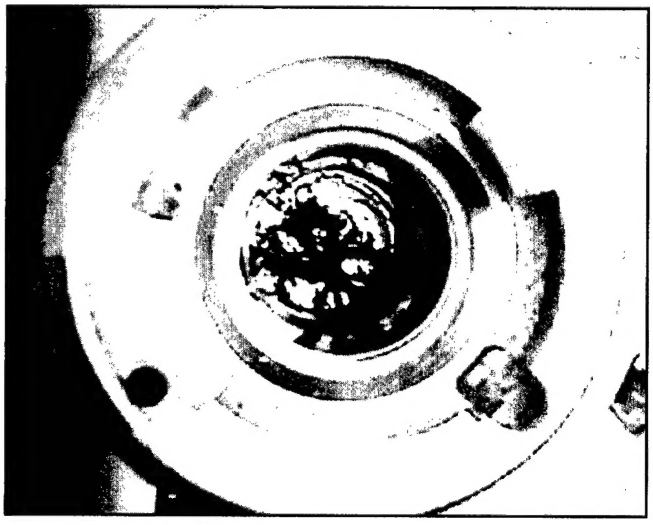
All four aircraft were immediately shut down. Crewmembers quickly egressed to assist in pouring frigid water, from the five-gallon cans at the points, onto the fuel-drenched refuelers. Once the refuelers were cleared out of the area, water was also applied to the fuel-sprayed side of the aircraft. A call to the local fire department brought a tanker truck to the scene. The fire truck further stabilized the fuel spill and brought racing heart rates back down to normal. Now it was time to figure out what had happened.

An open invitation to nest

The likely cause of the problem became apparent on visual inspection of the chalk one's fuel point. There, in the D-1 nozzle's shut-off valve, was a small twig. A further inspection of the aircraft fuel tanks showed more sticks and grass floating on top of the fuel in the main tank. It was the same



As a side note, the 15-ft hose should never have been used in the first place. Use of this extra hose disrupted the self-bonding feature of the -100 HTAR systems.



Brush filled HTAR T-fitting taken off the FARP sight

story for all the aircraft down the line.

The next obvious question was how could so much debris have possibly made it through the screens, filters and safety checks? Further investigation revealed the probable chain of events that lead to this near catastrophe.

A visual inspection of the HEMTT showed no traces of floating debris in the main tank. The D-1 fuel nozzle and 50-foot collapsible hoses seemed an unlikely source for contamination, since it was confirmed they were capped and plugged when they came out of the storage bin. This left the 15-foot non-collapsible hose as the primary suspect. The platoon normally used a 15-foot hose from a storage trailer, plugged together in an O-shape, but for this FARP, the truck's hose was used. A look at the HEMTT's hose storage area showed that there were no hose plugs or caps for the 15-foot hose on the truck. Further investigation of the rest of the battalion's HEMTT fleet illustrated the systemic problem. None of the HEMTTs in the motor pool had caps or plugs on their stored 15-foot fuel lines.

Additionally, a third of the storage tubes on the trucks had an unserviceable latch for the door that closed off the hose storage tube. This pair of deficiencies was equivalent to placing a "VACANCY" sign out for any bird in the nest-building mode.

Historically, the final line of defense for debris in the fuel lines would be an inline screen upstream of the D-1 nozzle. However, the unit was using the newer -100 HTARS fuel system that does not use an inline screen. The accumulation of the chain of events allowed a large bird nest from the 15-foot line to be pumped directly into the four refueling aircraft. The debris also disabled the automatic shut-off valve of the HTARS D-1 refuel nozzle, ultimately causing a fuel spill at all four points.

The end result was that one small, feathered saboteur, who was just "lookin' for a home", soundly beat a slice of US Army Aviation might on the training battlefield.

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Don't Use JP-8+100

Here's the latest word on JP-8+100 from the Army—don't use it. The Tank-Automotive Command Research, Development and Engineering Center (TARDEC), Aviation and Missile Command (AMCOM), and the US Army Petroleum Center have completed an evaluation of the Air Force aviation fuel additive +100. The Department of the Army has issued a message maintaining a No-Use Policy for the additive.

TARDEC has determined that the use of this additive in ground equipment can lead to a failure of filter/coalescer elements. Moreover, no practical test exists to determine the concentration level of +100 in JP-8. Consequently, all US Army activities must protect their fuel from accidental +100 contamination.

Where aviation is concerned, the use of the +100 additive is not detrimental to the performance, reliability, or safety of aircraft. Nonetheless, the inability to detect the additive, the probable negative consequences if used in ground equipment, and the fact that many US Army activities are using JP-8 for both aviation and mobility purposes, necessitate continued adherence to a No-Use Policy.

In the event of inadvertent JP-8+100 refueling, document the incident and quantity of JP-8+100 received, and register the incident with the Petroleum Center. This will allow them to identify, and fix, systemic problems.

An aircraft can operate with this additive without damage, and will be considered free of the additive after three refuelings with JP-8. If circumstances call for aircraft defueling, transfer the JP-8+100 into another aircraft. If this is not possible, the JP-8+100 must be disposed of in accordance with hazardous waste policies.

For ground equipment, defuel the JP-8+100 and treat it as hazardous waste. After defueling, consume one tank full of JP-8, then immediately replace filter/coalescer elements.

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A second look at fuel-handlers

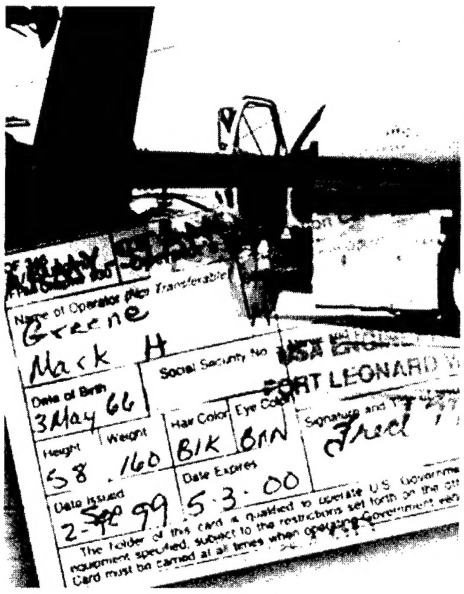
Each day new soldiers enter the military. These new soldiers may be training to do a number of things—fight as infantry soldiers, or become a crew chief on an aircraft. But there are other personnel that support the mission so that these soldiers can make it to their objectives. Those soldiers are the fuel handlers. The Army cannot move, shoot, or communicate without the fuel handlers. But even the fuel handler may not know what extra training is needed to safely refuel trucks, helicopters, or ground support equipment. Let's take a look at the selection, training, testing, and licensing of the fuel handler.

Selection

■ **The first step** — Conducting a records review is the first step in selecting an operator. Check for poor driving record, mental or emotional instability, physical handicaps and alcohol or drug related incidents. All these factors need to be considered.

■ **The second step** — Interviews will be conducted by the commander or an authorized representative. Some areas of concern include maturity, attitude, past driving record, hearing, and nervousness. If medication is used by the candidate on a regular basis, check with medical personnel to clear up any doubts or concerns about medication.

■ **The third step** – Check physical examinations and physical evaluation measures. Fuel handlers may have restrictions if they have pathological, psychological, or physiological problems. Operators are responsible for reporting any problems they have, which must be annotated on their DA Form 348 (Equipment Operator's Qualification Record).



Training and Testing

Operators will not participate in any hands-on vehicle or equipment training without a valid OF 346 stamped with the words, "ARMY LEARNER." All training for vehicles and equipment will be documented on a DA Form 348 prior to issuing an OF 346 (U.S. Government Motor Vehicle Operator's Identification Card). Units operating under the Unit Level Logistics System (ULLS) will use the automated form. The driver must successfully complete an installation/unit drivers training program before being issued a permanent license.

All operators will be given academic training as well as hands-on training. Upon completion of the training, the operator must successfully complete a written examination and a driver's performance test. Upon passing these tests, the student may be issued an OF 346 Standard Permit or ULLS equivalent.

Licensing

Military commercial driver license requirements include familiarization with passenger carrying, air brakes, combination vehicles, HAZMAT, and tank vehicles, as well as general driving knowledge. Since the operator is hauling fuel they must be trained in HAZMAT and have a hazardous material endorsement. (Per Title 49 of the Code of Federal Regulation). If operating on the flight line check out FM 1-300, *Flight Operations and Airfield Management* for special vehicle and driver requirements for ramp operations.

Other Resources

These TC's are available on the Internet in the Army Doctrine and Training Digital Library (ADTDL) at http://155.217.58.58.

■ Training Circular 21-305, *Wheeled Vehicle Accident Avoidance*

■ Training Circular 21-305-3, *M939-series 5-ton Cargo Truck*

These CDs can also be ordered over the Internet from the Defense Instructional Technology Information System (DAVIS/DITIS). The web site is http://dodimagery.afis.osd.mil/ Once there, click on Search DAVIS/DITIS and follow the ordering info.

■ CDR 55-01 — *Wheeled Vehicle Accident Avoidance*

■ CDR 55-15 — *M1083, 5-Ton Medium Tactical Vehicle (MTV)*

■ CD 55-21 — *M939, 5-Ton Cargo Truck*

■ CD 55-22 — *M813, 5-Ton Tactical Cargo Truck*

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Behavioral Safety

In previous issues of *Flightfax*, we have discussed organizational safety culture and its implications for commanders. Here, we explore two other important issues: first, the question of why so many soldiers engage in poor safety behaviors, and second, strategies for changing such behaviors. The more we can translate our knowledge of the behavioral causes of accidents into effective strategies for changing these maladaptive behaviors, the further we will advance our safety campaign.

"Organizational Safety Culture: Implications For Commanders," (October 1999 *Flightfax*) outlined how distributed concern for safety needs to be representative of all unit soldiers. This is nothing new. Indeed most soldiers are at least somewhat aware that inadequate safety practices have the potential for disaster. Nevertheless, these behaviors are widespread–even epidemic–in the Army. So, why do soldiers ignore the evidence and continue to behave in unsafe manners? Why are these habits so deeply ingrained?

Why are poor safety behaviors so widespread?

Unsafe habits can often be traced to leaders and first-line supervisors who have modeled unsafe behaviors. The Army is a constant learning environment, and unit leaders and NCOs are typically a soldier's most influential role models. Research reveals a strong relationship between unsafe habits in leaders and their soldiers. While other factors also contribute to this relationship, observational learning certainly plays an important causative role.

Soldiers also tend to be overly optimistic about their immunity to major safety problems. Unfortunately, unrealistic optimism undermines legitimate worry about risk; it may reduce the likelihood that soldiers will engage in accepted safety behaviors or accept safety interventions. Curiously, while soldiers are inclined to underestimate the risks associated with their own unsafe habits, they tend to have a much clearer impression of the potential catastrophic effects of such behaviors in others.

Another reason why poor safety habits are so widespread is that soldiers often have little reason or incentive to practice safe behaviors. In fact, many are recognized for their ability to "get more done with less" and for finding "innovative" solutions to such problems.

Rewards and recognition from superiors are highly reinforcing. Behaviors that are reinforced tend to be repeated. The adverse effects of these safety shortcuts may have little or no noticeable impact on safety and routine operations for many years. Yet, as these practices get repeated, the association between the unsafe behavior and risk loses focus—until its too late.

Thus we see that several factors work together to establish and maintain unsafe behaviors. So, how can we develop strategies to modify and change these behaviors?

Changing safety-damaging behaviors

As you can imagine, it is not an easy task to change behavior. All of us know of soldiers who, in spite of clear evidence that they are endangering themselves or others, continue to engage in unsafe behaviors (e.g., driving over the speed limit). An important step in getting soldiers to modify or eliminate their unsafe habits is to provide sufficient motivation to fuel such positive change.

Fear for safety

Fear appeals have often played a major role in efforts to motivate people to change their behavior by changing their attitudes toward safety. All of us have been exposed to fear campaigns to stop smoking, eat healthier, drink less, and other media efforts at health promotion. Persuasive safety-promotion messages with moderate fear appeal can also be effective in changing safety attitudes and behaviors. Fear of high-risk behaviors, together with knowledge about effective preventive practices, will result in both significant increases in safer behavior and substantial reductions in the rate of accidents. Research has shown that informational campaigns may be most effective when they (1) are colorful and related to real life (e.g., use case histories), (2) avoid statistics and jargon, (3) are short, clear, and direct, (4) present strong messages at the beginning and end of the message, (5) state conclusions explicitly rather than merely implying them, and (6) are delivered by a prestigious and trustworthy individual.

No short-term solutions

History shows that change will not occur overnight. Such efforts are generally more effective in changing attitudes than behaviors. However, such campaigns have some important benefits that are likely to show up in the long run. First, they will acquaint soldiers

with the risks they might not have been aware of associated with their behavior. Such messages can and do have a cumulative effect over time in modifying both the Army's collective attitude about safety and eventually the safety behavior of soldiers. For example, it is now clear that Army attitudes toward smoking in government buildings, illegal drug use, and driving under the influence of alcohol have changed appreciably in recent years due to hardline, negative, zero-tolerance campaigns.

Because poor safety habits are so deeply ingrained and widespread, it is understandable that efforts to change safety-impairing behaviors by changing people's attitudes are often not sufficient. To push safety in a positive direction, hardline policies and procedures can provide the incentive or motivation to behave in a safe manner. Yet such practices often fall short by not providing the specific behavioral skills to accomplish this goal. Various behavior therapies are based on the belief that bad habits are learned via the same principles that govern the learning of positive behavior. Leaders and safety professionals must focus on the target safety-impairing habits. They can be changed by modifying the conditions that cause and support these harmful behaviors.

In a future article, I will explore the cultural changes that can be used to change poor safety habits into safe behavioral practices.

Informational campaigns may be most effective when they:

1. Are colorful and related to real life (e.g., use case histories)
2. Avoid statistics and jargon
3. Are short, clear, and direct
4. Present strong messages at the beginning and end of the message
5. State conclusions explicitly rather than merely implying them
6. Are delivered by a prestigious and trustworthy individual

—Major Robert Wildzunas, US Army Center for Preventive Health Medicine, DSN 343-7593, (301)619-7593, robert.wildzunas@det.amedd.army.mil

NCO Corner

Safety is NCO Business

As NCOs, our job is harder than most. We must see that our soldiers stay alive and uninjured while preparing for combat. We must train our new soldiers to follow correct procedures, retrain those who don't, and enforce the use of proper procedures in every task.

Every day in a garrison or field environment, we hone our soldiering skills to a fine point. We take inexperienced soldiers and transform them into highly-skilled crewmembers. As we train, we teach correct procedures and relentlessly enforce their use. We are constantly aware that such things as boredom, routine training, and laziness can lead soldiers to take shortcuts that could result in accidents.

Our business is to keep soldiers alive, intact, and able to fight. Only through positive action can we do this. Too many times, we let safety become a late Friday afternoon class that takes 10 minutes to present. Why? Because it's a requirement. We must look at reality. Accidents will continue as long as NCOs consider safety as one more required class to teach during mandatory training time. We need to take the time to convey to our soldiers realistic hazards that are potentially harmful or fatal.

Everyone has experienced an unfortunate situation at one time or another that may have resulted in loss of life or serious injury of another soldier, friend, or relative. As unfortunate as they may be, we can use them as a foundation for future prevention measures and teach our soldiers the importance of safe, precautionary methods of performing our duties.

NCOs must address safety daily in a no-compromise manner, teach soldiers to perform to standard, and check and correct any deficiencies found. All NCOs must accept that it is our job to supervise soldiers to safely accomplish our mission. We have a responsibility to the stripes we wear. If a soldier sees an NCO who doesn't perform to standard, whose fault is it if that soldier has an accident? The NCO stands responsible.

Safety is not a careless turn of events. It is hard work, dedication, performance to standard, and a sincere belief that accidents don't just happen but are caused by things that are allowed to continue uncorrected. We NCOs must take charge, because safety is NCO business.

(Reprinted courtesy of *Countermeasure*.)

—MSG Terry Smart, Ground Systems and Accident Investigation Division, USASC, DSN 558-1243 (334) 255-1243, smartt@safetycenter.army.mil

Accident briefs

Information based on *preliminary* reports of aircraft accidents

AH64

Class B
D series

■ During maintenance operational check, warning system activated, followed by uncommanded forward cyclic. Main rotor blades contacted pilot night vision system.

Class E
D series

■ During run-up, No. 1 starter overheated. Aircraft was shut down without further incident. No. 1 starter was replaced.

CH47

Class C
D series

■ During aerial recovery of a UH-60, main rotor blade separated from the sling-loaded aircraft.

Class E
D series

■ Fuel was observed leaking from heater exhaust vent during hover. Aircraft landed without further incident. Ignitor plug was replaced.

■ Forward transmission developed high frequency vibration during hover. Aircraft landed without further incident. No. 1 flight boost pump was replaced.

OH6

Class B
J series

■ Aircraft struck trees and crashed while conducting aerial gunnery. Major damage to airframe. Minor injuries to crew.

OH58

Class E
C series

■ During hover, it was observed that the turbine outlet temperature gauge was not accurate. Aircraft landed without further incident. Turbine outlet temperature gauge was replaced.

■ Cyclic was binding during hover. Aircraft landed without further incident. Tail rotor pitch bell crank was replaced.

■ Rotor tachometer failed during cruise flight. Aircraft landed without further incident. Short connector on rotor tachometer was replaced.

■ During hover, tachometer gauge failed. Aircraft landed without further incident. Dual tachometer replaced.

■ Generator failed during cruise flight. Aircraft landed without further incident. Generator was replaced.

■ While on the ground with engine running, transmission oil was found leaking from rotor tach generator. Aircraft was shut down without further incident. Tachometer generator was replaced.

UH1

Class E
H series

■ While flying nap of the earth, master caution light illuminated with no segment light. The aircraft was landed safely. It was determined that the master caution panel still functioned. On recovery, a one-time flight back to home station was authorized. On the return flight, the master caution light and transmission segment light illuminated. The aircraft was landed and another master caution box was installed.

■ On postflight, crew discovered hydraulic fluid reservoir was empty, and hydraulic fluid dripping from transmission well. No warning or caution lights or control feedback had been observed during flight. Maintenance replaced hydraulic line from reservoir to pump.

■ Main transmission was found to be leaking during hot refueling. Aircraft was shut down without further incident. Transmission internal filter gasket was replaced.

■ Fuel leak was observed during cruise flight. Aircraft was landed without further incident. Fuel line was replaced.

■ Smoke and fumes were observed in the cockpit during cruise flight. Aircraft landed without further incident. Gyro ASN-43 was replaced.

UH60

Class C
L series

■ Nose compartment door opened during flight, striking windshield, damaging wiper systems, all windshields, FAT gauge, and nose compartment door.

Class D
A series

■ Aircraft was hovering over a barge while preparing to hook up external load. The barge shifted due to the rotor wash. A metal stanchion on the starboard side of the barge contacted the right main gear. A small cut was made into the rim of the wheel.

Class E
A series

■ During cruise, APU advisory backup pump illuminated. Aircraft landed without further incident. Schrader valve replaced.

■ During low level flight, No. 2 hydraulic pump failed. Aircraft landed without further incident. Hydraulic pump replaced.

■ While on the ground, engines running, No. 1 engine failed. Aircraft was shut down without further incident. Replaced No. 1 fuel control.

■ During cruise flight, APU fire warning indicator illuminated with the corresponding master caution light. Aircrew confirmed no visible signs of fire existed and aircrew returned to home station. Maintenance personnel determined that the time flame detector had failed.

■ Stabilator failed during taxi. Aircraft was shut down without further incident. Airspeed transducer replaced.

■ Radar altimeter became inoperable during taxi. Aircraft was shut down without further incident. Radar altimeter was replaced.

■ Damage to right MLG strut, faring, and main rotor blades discovered during preflight. It is suspected that damage occurred during a hard landing when main rotor blades struck the ALQ-144.

For more information on selected accident briefs, call DSN 558-9855 (334-255-9855). Note: Information published in this section is based on *preliminary* mishap reports.

New e-mail addresses for Safety Center

The US Army Safety Center's e-mail addresses have been updated. There will be a transition period of several months, during which either address should get through to us.

For example, our old *Flightfax* address was:
flightfax@safety-emh1.army.mil

Our new address is:
flightfax@safetycenter.army.mil

Please note the change, and keep those cards, letters and e-mails coming.

FY00 Aviation Accidents through 31 March

		Class A	Class B	Class C	Total
ACCIDENTS	Total* Avn Acdts	4	4	38	49
	Flight Acdt Rate	0.87	0.43	6.71	8.01
RATE COMPARISON	FY00 vs. FY99	-56%	-41%	-14%	-23%
	FY00 vs. 3-yr avg	-48%	-55%	-17%	-25%
Aviation Military Fatalities					2

* Includes Flight and Non-flight aviation accidents.

Test your Safety eye-Q

True or False

1. Aircrew members are most at risk when flying nap of the earth.
2. A pair of polarized sunglasses can protect the eyes from harmful ultraviolet (UV) rays.
3. Bottle rockets are the most dangerous type of fireworks.
4. Most objects that cause eye injuries are smaller than the head of a pin.
5. Eye injuries occur to off-duty personnel more often than on-duty.
6. Football is the most dangerous sport for eye injuries.
7. Wearing a visor can provide protection from bird strikes as well as UV rays.
8. Eye diseases, such as glaucoma, are the leading cause of blindness in the U.S.
9. Refractive surgeries (RK, PRK, and LASIK) can decrease night visual performance.
10. Colored contact lenses provide adequate protection from harmful UV rays.

ANSWERS:

1. False. Air crewmembers are most at-risk when involved in off-duty activities.
2. False. Polarized sunglasses do not block UV rays, they only decrease the amount of light entering the eye.
3. True
4. True
5. True
6. False. Basketball and baseball cause the most eye injuries.
7. True.
8. False. Eye injury is the leading cause of blindness.
9. True. Night vision is severely affected by this UNAUTHORIZED surgery.
10. False. Most contact lenses do not provide adequate protection from UV rays. Eye health organizations recommend they be worn with UV blocking eyewear.

Source: Mr. Clarence E. Rash, Research Physicist. US Army Aeromedical Research Laboratory DSN 588-6814, (334) 255-6814, clarence.rash@se.amedd.army.mil

(The views, opinions, and/or findings in this quiz are those of the author, and should not be construed as an official Department of the Army position, policy, or decision.)

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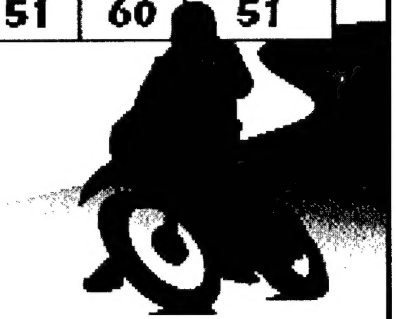
POV Fatalities through 31Mar

FY00	FY99	3-yr Avg
51	60	51



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Commanding